

CLAIMS

We claim:

1. A door latch assembly for installation on a door of a vehicle, the door having an inner panel, an outer panel, and a cavity defined between at least portions of the inner and outer panels, the inner panel having an interior side, the door latch assembly comprising:
  - a latch securable to the door at least partially within the cavity and actuatable between a plurality of states;
  - a linkage coupled to the inner panel, the linkage being operably coupled to the latch and accessible from the interior side; and
  - a user manipulatable control coupled to the linkage by insertion of the user manipulatable control into the inner panel from the interior side of the inner panel, the user manipulatable control being operable to selectively actuate the latch through the linkage between the plurality of states.
2. The door latch assembly of claim 1, wherein the door includes a trim panel coupled to the interior side of the inner panel, the trim panel having an interior side opposite to the inner panel and an aperture, wherein the linkage is securable to the door such that the linkage is accessible from the interior side of the trim panel through the aperture, and wherein the user manipulatable control is at least partially insertable through the aperture from the interior side of the trim panel to couple to the linkage.
3. The door latch assembly of claim 1, wherein the user manipulatable control includes an inside door handle, and wherein the plurality of states includes an open state and a closed state.
4. The door latch assembly of claim 3, further comprising a cable connected between the linkage and the latch, wherein the inside door handle includes a projection, and wherein the linkage includes a cable actuator coupled between the cable and the projection, the inside door handle being operable to actuate the latch through the projection, cable actuator, and cable between open and closed states.
5. The door latch assembly of claim 3, wherein the inside door handle is a self-docking type inside door handle.

6. The door latch assembly of claim 1, further comprising a housing coupled to the linkage and the door, wherein the linkage is coupled to the inner panel through the housing.

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7. The door latch assembly of claim 6, wherein the housing includes a mounting flange fastened to the inner panel.

8. The door latch assembly of claim 1, further comprising a cable connected between the linkage and the latch, the user manipulatable control being operable to selectively actuate the latch through the linkage and cable.

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9. A method of installing a door latch assembly to a door of a vehicle, the method comprising:

providing a latch that is actuatable between a plurality of states;

operably coupling a linkage to the latch;

5           securing the latch to the door within a cavity of the door defined at least partially by inner and outer panels;

          securing the linkage to the inner panel such that the linkage is accessible from an interior side of the inner panel;

          coupling the user manipulatable control to the linkage from the interior  
10   side; and

          operating the user manipulatable control to selectively actuate the latch through the linkage between the plurality of states.

10. The method claim 9, wherein:

15           securing the linkage includes securing the linkage to the inner panel such that the linkage is accessible from an interior side of a trim panel coupled to the inner panel through an aperture in the trim panel; and

          the method further comprises inserting a user manipulatable control at least partially through the aperture from the interior side of the trim panel.

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11. The method of claim 9, wherein coupling the user manipulatable control includes coupling an inside door handle to the linkage from the interior side, and wherein operating the user manipulatable control includes operating the inside door handle to selectively actuate the latch through the linkage between open and closed states.

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12. The method of claim 11, wherein:

operably coupling a linkage to the latch includes operably coupling the linkage to the latch with a cable;

30           coupling the inside door handle to the linkage includes coupling a projection of the inside door handle to a cable actuator of the linkage; and

          operating the inside door handle includes operating the inside door handle to selectively actuate the latch through the projection, cable actuator, and cable between the open and closed states.

13. The method of claim 11, further comprising docking the inside door handle to the inner panel by insertion of the inside door handle within the aperture.

14. The method of claim 9, wherein securing the linkage to the inner panel  
5 includes securing the linkage to the inner panel through a housing such that the linkage is accessible from the interior side of the inner panel.

15. The method of claim 14, wherein securing the linkage to the inner panel through the housing includes fastening a mounting flange of the housing to the inner panel.  
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16. The method of claim 9, wherein operably coupling a linkage to the latch includes operably coupling the linkage to the latch with a cable.

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17. A door latch assembly for installation on a door of a vehicle, the door having a frame and a trim panel coupled to the frame, the trim panel having an exterior side, an interior side, and an aperture in communication between the exterior and interior sides, the door latch assembly comprising:

5 a latch securable to the door and located on the exterior side of the trim panel, the latch being actuatable between open and closed states; and

a self-docking inside door handle assembly at least partially insertable within the aperture from the interior side to couple to the frame through the aperture without the use of fasteners and to operably couple to the latch, the inside door handle  
10 assembly being operable to selectively actuate the latch between the open and closed states.

18. The door latch assembly of claim 17, further comprising a linkage securable to the frame on the external side, the linkage being operably coupled to the latch  
15 and accessible from the interior side through the aperture, wherein the inside door handle assembly couples with the linkage when the inside door handle assembly is at least partially inserted into the door, and wherein the inside door handle assembly operates to selectively actuate the latch through the linkage between open and closed states.

20 19. The door latch assembly of claim 18, further comprising a cable connected between the linkage and the latch, wherein the inside door handle assembly includes a projection, and wherein the linkage includes a cable actuator coupled between the cable and the projection, the inside door handle assembly being operable to actuate the latch through the projection, cable actuator, and cable between the open and closed states.

25 20. The door latch assembly of claim 18, further comprising a housing coupled to the linkage and the door, wherein the linkage is coupled to the door through the housing.

30 21. The door latch assembly of claim 20, wherein the housing includes a mounting flange fastened to the frame on the exterior side.

22. The door latch assembly of claim 18, further comprising a cable connected between the linkage and the latch, the inside door handle assembly being operable to selectively actuate the latch through the linkage and cable between the open and closed states.

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23. The door latch assembly of claim 17, wherein the inside door handle assembly includes a clip adapted to secure the inside door handle assembly with respect to the door when the inside door handle assembly is at least partially inserted into the aperture from the interior side.

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24. The door latch assembly of claim 17, wherein the inside door handle assembly includes a housing and an inside door handle pivotally coupled to the housing, the housing being sized to be press-fit into the aperture and to remain secured within the aperture when the inside door handle is operated to selectively actuate the latch between the open and closed states.

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25. The door latch assembly of claim 17, wherein the trim panel defines a plane, and wherein the inside door handle assembly is coupled to the door by moving the inside door handle assembly substantially perpendicular to the plane.

26. A method of installing a door latch assembly to a door of a vehicle, the method comprising:

- providing a latch that is actuatable between open and closed states;
- securing the latch on an exterior side of a trim panel of the door coupled to  
5 the frame;
- at least partially inserting a self-docking inside door handle assembly through an aperture in the trim panel from an interior side of the trim panel;
- coupling the inside door handle assembly to the door by at least partially inserting the inside door handle through the aperture;
- 10 operably coupling the inside door handle assembly to the latch; and
- operating the inside door handle assembly to selectively actuate the latch between the open and closed states.

27. The method of claim 26, further comprising:

- 15. operably coupling a linkage to the latch;
- securing the linkage to the frame on the external side such that the linkage is accessible from the interior side through the aperture, wherein operably coupling the inside door handle assembly includes coupling the inside door handle assembly to the linkage, and wherein operating the inside door handle assembly includes operating the inside door  
20 handle assembly to selectively actuate the latch through the linkage between the open and closed states.

28. The method of claim 27, wherein:

- operably coupling a linkage to the latch includes operably coupling the linkage to  
25 the latch with a cable;
- coupling the inside door handle assembly to the linkage includes coupling a projection of the inside door handle to a cable actuator of the linkage; and
- operating the inside door handle assembly includes operating the inside door handle assembly to selectively actuate the latch through the projection, cable actuator, and  
30 cable between the open and closed states.

29. The method of claim 27, wherein securing the linkage to the frame includes securing the linkage to the frame through a housing such that the linkage is accessible from the interior side through the aperture.

30        The method of claim 29, wherein securing the linkage to the door through the housing includes fastening a mounting flange of the housing to the frame.

5            31.        The method of claim 27, wherein operably coupling a linkage to the latch includes operably coupling the linkage to the latch with a cable, and wherein operating the inside door handle assembly includes operating the inside door handle assembly to selectively actuate the latch through the linkage and cable between the open and closed states.

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32.        The method of claim 26, wherein coupling the inside door handle assembly to the frame through the aperture without the use of fasteners includes connecting a clip of the inside door handle assembly to the frame.

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33.        The method of claim 26, wherein coupling the inside door handle assembly to the frame through the aperture without the use of fasteners includes press-fitting a housing of the inside door handle assembly into the aperture, the method further comprising retaining the inside door handle assembly within the aperture with the housing when the inside door handle is operated to selectively actuate the latch between the open and closed states.

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34.        The method of claim 26, wherein coupling the inside door handle assembly to the frame through the aperture without the use of fasteners includes moving the inside door handle assembly perpendicular to a plane defined by the trim panel.



35. A door latch assembly for installation on a door of a vehicle, the door having an outer panel with an interior side and an exterior side, the door latch assembly comprising:

- 5 a latch securable to the door, located on the interior side of the outer panel, and actuatable between a plurality of states; and
- a linkage operably coupled to the latch;
- a bracket coupled between the latch and the linkage, the bracket being sufficiently resilient to retain the linkage in a position relative to the latch.

10 36. The door latch assembly of claim 35, wherein the door includes an aperture communicating between the interior and exterior sides, wherein the linkage is positioned by the bracket to be accessible from the exterior side through the aperture.

15 37. The door latch assembly of claim 36, further comprising a user manipulatable control insertable at least partially through the aperture from the exterior side to couple to the linkage, the user manipulatable control being operable to selectively actuate the latch through the linkage between the plurality of states.

20 38. The door latch assembly of claim 37, wherein the user manipulatable control includes an outside door handle, and wherein the plurality of states includes an open state and a closed state.

25 39. The door latch assembly of claim 37, wherein the user manipulatable control includes an outside door lock, and wherein the plurality of states includes a locked state and an unlocked state.

30 40. The door latch assembly of claim 37, wherein the user manipulatable control includes an outside door handle and an outside door lock, and wherein the plurality of states includes an open state, a closed state, a locked state, and an unlocked state.

41. The door latch assembly of claim 35, wherein the door includes an aperture, and wherein the linkage is positioned by the bracket to at least partially extend through the aperture.

42. The door assembly of claim 35, wherein the linkage includes a sill button, and wherein the plurality of states includes a locked and an unlocked state.

43. The door latch assembly of claim 35, wherein the bracket is flexible.

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44. The door latch assembly of claim 35, wherein the bracket comprises at least one of rubber and resiliently deformable plastic.

45. The door latch assembly of claim 35, wherein the linkage is operably  
10 coupled to the latch by a cable.

46. The door latch assembly of claim 35, wherein the linkage is coupled to the door in substantially the same position as the position relative to the latch when the latch is secured to the door.

47. A method for installing a door latch assembly on a door of a vehicle, the method comprising:

providing a latch that is securable to the door on an interior side of the door and actuatable between a plurality of states;

5 operably coupling a linkage to the latch;

coupling a resilient bracket between the latch and the linkage;

securing the latch to the door;

retaining the linkage in a position relative to the latch with the bracket.

10 48. The method of claim 47, wherein retaining the linkage includes positioning the linkage such that the linkage is accessible from the exterior side through an aperture in the door.

49. The method of claim 48, further comprising at least partially inserting a  
15 user manipulatable control through the aperture from the exterior side to couple to the linkage, and operating the user manipulatable control to selectively actuate the latch through the linkage between the plurality of states.

50. The method of claim 49, wherein at least partially inserting a user  
20 manipulatable control includes at least partially inserting an outside door handle, and wherein operating the user manipulatable control includes operating the outside door handle to selectively actuate the latch through the linkage between open and closed states.

51. The method of claim 49, wherein at least partially inserting a user  
25 manipulatable control includes at least partially inserting an outside door lock, and wherein operating the user manipulatable control includes operating the outside door lock to selectively actuate the latch through the linkage between locked and unlocked states.

52. The method of claim 51, wherein at least partially inserting a user manipulatable control includes at least partially inserting an outside door handle, and wherein operating the user manipulatable control includes operating the outside door handle and outside door lock to selectively actuate the latch through the linkage between open, closed, locked, and unlocked states.

53. The method of claim 47, further comprising positioning the linkage such that the linkage at least partially extends through an aperture in the door.

54. The method of claim 53, wherein positioning the linkage includes positioning a sill button such that the sill button extends through the aperture.

55. The method of claim 47, wherein operably coupling a linkage to the latch includes operably coupling the linkage to the latch with a cable.

56. The method of claim 47, further comprising coupling the linkage to the door in substantially the same position as the position relative to the latch.

57. A door latch assembly for installation on a door of a vehicle, the door having an outer panel with an interior side and an exterior side, the door latch assembly comprising:

- 5 a latch securable to the door and located on the interior side of the outer panel and actuatable between a plurality of states;
- a user manipulatable control securable to the door;
- a linkage operably coupled between the latch and the user manipulatable control; and
- 10 a shield at least partially covering the linkage along a length of the linkage between the user manipulatable control and the latch to at least partially restrict access to the linkage.

58. The door latch assembly of claim 57, wherein the user manipulatable control includes an outside door handle, and wherein the plurality of states includes an open state and a closed state.

59. The door latch assembly of claim 57, wherein the user manipulatable control includes an outside door lock, and wherein the plurality of states includes a locked state and an unlocked state.

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60. The door latch assembly of claim 57, wherein the user manipulatable control includes an outside door handle and an outside door lock, and wherein the plurality of states includes an open state, a closed state, a locked state, and an unlocked state.

25 61. The door latch assembly of claim 57, wherein the user manipulatable control includes an inside door lock, and wherein the plurality of states includes a locked state and an unlocked state.

30 62. The door latch assembly of claim 61, wherein the inside door lock is a sill button.

63. The door latch assembly of claim 57, wherein the shield member is flexible.

64. The door latch assembly of claim 57, wherein the shield member comprises at least one of rubber and resiliently deformable plastic.

65. The door latch assembly of claim 57, wherein the linkage includes a cable.

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66. The door latch assembly of claim 57, wherein the shield member substantially covers all sides of the linkage along the length of the linkage.

67. The door latch assembly of claim 57, wherein the shield member  
10 encapsulates the linkage between the latch and the user manipulatable control.

68. A door latch assembly for installation on a door of a vehicle, the door having an outer panel with an interior side, an exterior side, and an aperture communicating between the interior and exterior sides, the door latch assembly comprising:

5                   a housing accessible from the exterior side through the aperture; and  
                  an outside door lock at least partially received within the housing through the aperture from the exterior side, the outside door lock having a flange portion, and first and second states, the outside door lock being freely removable from the housing in the first state and the outside door lock being resistant to removal from the housing in the  
10 second state, a portion of the door surrounding the aperture being coupled between the flange and the housing when the outside door lock is in the second state.

69. The door latch assembly of claim 68, further comprising a latch securable to the door on the interior side and actuatable between locked and unlocked states,  
15 wherein:

                  the housing includes a linkage operably coupled to the latch;  
                  the outside door lock couples to the linkage when the outside door lock is at least partially received within the housing; and  
                  the outside door lock is operable to selectively actuate the latch through the linkage  
20 between the locked and unlocked states.

70. The door latch assembly of claim 69, wherein the outside door lock is operable to selectively actuate the latch by turning a key inserted into the outside door lock.  
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71. The door latch assembly of claim 69, wherein the outside door lock includes a central axis and an extension positioned a distance away from and rotatable about the central axis, the extension being engagable with the linkage.

30               72. The door latch assembly of claim 71, further comprising a cable connected between the linkage and the latch, wherein the linkage includes a cable actuator coupled between the extension and the cable such that the outside door lock is operable to actuate the latch through the extension, cable actuator, and cable between the locked and unlocked states.

73. The door latch assembly of claim 68, wherein the housing includes a cylindrical opening, and wherein the outside door lock is received within the cylindrical opening of the housing.

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74. The door latch assembly of claim 68, wherein the outside door lock includes a projection, the projection being retracted in the first state to retain the outside door lock in the housing and extended in the second state in which the outside door lock is insertable in the housing.

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75. The door latch assembly of claim 74, wherein the projection is biased toward an extended state with respect to the housing.

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76. A method for assembling a door latch assembly on a door of a vehicle, the method comprising:

providing an outside door lock having a flange portion, and first and second states;

5 positioning a lock housing on an interior side of the door such that the lock housing is accessible from an exterior side of the door through an aperture defined in the door;

at least partially inserting the outside door lock within the housing through the aperture from the exterior side of the door while the outside door lock is in the first state,

10 coupling a portion of the door defining the aperture between the flange portion and the housing;

changing the outside door lock from the first state to the second state after the outside door lock is at least partially inserted into the housing; and

15 resisting removal of the outside door lock from the housing while the outside door lock is in the second state.

77. The method of claim 76, further comprising:

providing a latch actuatable between locked and unlocked states;

20 securing the latch to the door on the interior side;

coupling a linkage to the housing;

operably coupling the linkage to the latch;

coupling the outside door lock to the linkage when the outside door lock is at least partially received within the housing; and

25 operating the outside door lock to selectively actuate the latch through the linkage between the locked and unlocked states.

78. The method of claim 77, wherein operating the outside door lock includes turning a key inserted into the outside door lock.

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79. The method of claim 77, wherein providing an outside door lock includes providing an outside door lock having a central axis and a pin positioned a distance away from and rotatable about the central axis, and wherein the method further comprises coupling the pin to the linkage by at least partially inserting the outside door lock within  
5 the housing.

80. The method of claim 79, wherein operatively coupling the linkage to the latch includes operatively coupling a cable actuator of the linkage to the latch with a cable, and wherein operating the outside door lock includes operating the outside door lock to  
10 selectively actuate the latch through the pin, cable actuator, and cable between the locked and unlocked states.

81. The method of claim 76, wherein:  
at least partially inserting the outside door lock includes at least partially inserting  
15 the outside door lock within a cylindrical opening of the housing through the aperture from the exterior side while the outside door lock is in the first state;  
changing the outside door lock includes changing the outside door lock from the first state to the second state after the outside door lock is at least partially inserted into the cylindrical opening; and  
20 resisting removal of the outside door lock includes resisting removal of the outside door lock from the cylindrical opening while the outside door lock is in the second state.

82. The method of claim 76, wherein:  
providing an outside door lock includes providing an outside door lock having a  
25 projection that is retracted in the first state and extended in the second state;  
at least partially inserting the outside door lock includes at least partially inserting the outside door lock within the housing through the aperture from the exterior side while the projection is retracted;  
changing the outside door lock includes extending the projection after the outside  
30 door lock is at least partially inserted into the housing; and  
resisting removal of the outside door lock includes resisting removal of the outside door lock from the housing while the projection is extended.

83. The method of claim 82, further comprising biasing the projection toward the extended state.

84. A door latch assembly for installation on the door of a vehicle, the door latch assembly comprising:

a latch having at least one projection;

5 a slot along which the latch is movable with respect to the door, the slot dimensioned to slidably receive the at least one projection, the latch movable between a first state where the at least one projection is located at a first location along the slot, and a second state where the at least one projection is located in a second location spaced apart from the first location along the slot, the latch being securable to the door in the second state.

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85. The door latch assembly of claim 84, wherein the slot is formed by a channel coupled to the door.

86. The door latch assembly of claim 84, wherein the at least one projection is a  
15 pin.

87. The door latch assembly of claim 86, wherein the pin includes an enlarged head and a shaft portion extending between the latch and the enlarged head, the shaft portion extending through the at least one slot, and the enlarged head being positioned on a  
20 side of the at least one slot opposite the latch.

88. The door latch assembly of claim 84, further comprising a carrier panel securable to the door, wherein the slot is located on the carrier panel.

25 89. The door latch assembly of claim 88, wherein the slot includes a first end and an opposite second end, the first end being open to receive the at least one projection, wherein the latch is maintained within the slot by a stop on the carrier.

90. The door latch assembly of claim 89, wherein the stop is a cradle that  
30 supports the latch in the first state.

91. The door latch assembly of claim 84, further comprising a linkage operably coupled to the latch, wherein the door includes an external side, an internal side, and an aperture communicating between the internal and external sides, the linkage being accessible through the aperture from the external side when the latch is in the second state.

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92. The door latch assembly of claim 91, further comprising a user manipulatable control insertable through the aperture from the external side to couple with the linkage when the latch is in the second state.

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93. The door latch assembly of claim 92, wherein the user manipulatable control is an outside door handle.

94. The door latch assembly of claim 92, wherein the user manipulatable control is an outside door lock.

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95. The door latch assembly of claim 84, further comprising an inside door lock operably coupled to the latch, wherein the door includes an aperture, the inside door lock extending through the aperture when the latch is moved to the second state.

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96. The door latch assembly of claim 95, wherein the inside door lock includes a sill button.

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97. The door latch assembly of claim 84, wherein:  
the at least one projection includes a first projection and a second projection;  
the slot is a first slot, and  
the door latch assembly includes a second slot;  
the latch is movable between the first state in which the first projection is located along the first slot in the first location and the second projection is located along the second slot in a first location of the second slot, and the second state where the first projection is located along the first slot in the second location spaced apart from the first location of the first slot and the second projection is located along the second slot at a second location spaced apart from the first location of the second slot.

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98. The door latch assembly of claim 97, wherein the orientation of the latch is fixed by the first and second projections and the first and second slots at the second locations.

- 5            99. The door latch assembly of claim 98, wherein the orientation of the latch is dependent upon the position of the latch between the first and second states.

100. A method for installing a door latch assembly on the door of a vehicle, the method comprising:

providing a latch having at least one projection;

5 receiving the at least one projection within a slot extending a length along the door;

moving the latch between a first state in which the at least one projection is located at a first location along the slot, and a second state in which the at least one projection is located in a second location spaced apart from the first location along the slot; and

10 securing the latch to the door in the second state.

101. The method of claim 100, wherein:

providing a slot includes providing a channel having a length;

15 receiving the at least one projection within the slot includes receiving the at least one projection within the channel; and

moving the latch includes moving the latch between a first state in which the at least one projection is located at a first location along the channel, and a second state in which the at least one projection is located in a second location along the channel spaced apart from the first location along the channel.

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102. The method of claim 100, wherein providing a latch having at least one projection includes providing a latch with a pin, wherein receiving the at least one projection includes receiving the pin within the slot, and wherein moving the latch includes moving the latch between a first state in which the pin is located at a first location along the slot, and a second state in which the pin is located in a second location spaced apart from the first location along the slot.

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103. The method of claim 102, wherein receiving the pin within the slot includes extending a shaft portion of the pin through the slot, and positioning an enlarged head on a side of the slot opposite the latch.

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104. The method of claim 100, further comprising:

providing a carrier panel on which the slot is defined; and

securing the carrier panel to the door.

105. The method of claim 104, further comprising:  
mounting a stop to the carrier panel; and  
maintaining the latch within the slot by the stop.

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106. The method of claim 105, wherein mounting a stop includes mounting a cradle to the carrier panel, the method further comprising supporting the latch in the first state with the cradle, and wherein maintaining the latch includes maintaining the latch within the slot by the cradle.

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107. The method of claim 100, further comprising operably coupling a linkage to the latch, wherein moving the latch includes moving the latch to the second state in which the linkage is accessible through an aperture of the door from an external side of the door.

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108. The method of claim 107, further comprising:  
at least partially inserting a user manipulatable control through the aperture from the external side;  
coupling the user manipulatable control to the linkage from the external side when  
the latch is in the second state; and  
operating the user manipulatable control to actuate the latch through the linkage.

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109. The method of claim 108, wherein:  
at least partially inserting a user manipulatable control includes at least partially  
inserting an outside door handle through the aperture from the external side;  
coupling the user manipulatable control includes coupling the outside door handle to the linkage from the external side when the latch is in the second state; and  
operating the user manipulatable control includes operating the outside door handle to actuate the latch through the linkage between open and closed states.

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110. The method of claim 109, wherein:

at least partially inserting a user manipulatable control includes at least partially inserting a outside door lock through the aperture from the external side;

coupling the user manipulatable control includes coupling the outside door lock to  
5 the linkage from the external side when the latch is in the second state; and

operating the user manipulatable control includes operating the outside door lock to actuate the latch through the linkage between locked and unlocked states.

111. The method of claim 100, further comprising operably coupling an inside  
10 door lock to the latch, wherein moving the latch includes extending the inside door lock through an aperture of the door when the latch is moved to the second state.

112. The method of claim 111, wherein operably coupling an inside door lock includes operably coupling a sill button to the latch, and wherein extending the inside door  
15 lock includes extending the sill button through the aperture when the latch is moved to the second state.

113. The method of claim 100, wherein:

providing a latch having at least one projection includes providing a latch having  
20 first and second projections;

providing a slot includes providing first and second slots;

receiving the at least one projection within the slot includes receiving the first projection within the first slot and receiving the second projection within the second slot;  
and

25 moving the latch includes moving the latch between the first state where the first projection is located along the first slot in the first location of the first slot and the second projection is located along the second slot in a first location of the second slot, and a second state where the first projection is located along the first slot in a second location spaced apart from the first location of the first slot and the second projection is located  
30 along the second slot at a second location spaced apart from the first location of the second slot.

114. The method of claim 113, further comprising fixing the orientation of the latch at the second location with the first and second projections and the first and second slots.

- 5           115. The method of claim 114, further comprising fixing the orientation of the latch in states between the first and second states.